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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/618,317	07/11/2003	Guolin Ma	10020800-1	4776

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AGILENT TECHNOLOGIES, INC.  
Legal Department, DL429  
Intellectual Property Administration  
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EXAMINER

HOLTON, STEVEN E

ART UNIT PAPER NUMBER

2673

DATE MAILED: 09/07/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Office Action Summary</b>	Application No.	Applicant(s)	
	10/618,317	MA ET AL.	
	Examiner	Art Unit	
	Steven E. Holton	2673	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

#### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

- 1) ☒ Responsive to communication(s) filed on 11 July 2003.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

- 4) ☒ Claim(s) 1-14 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-14 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

#### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 11 July 2003 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

#### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

#### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)  | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                                   | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

## **DETAILED ACTION**

### ***Drawings***

1. The drawings are objected to under 37 CFR 1.83(a). The drawings must show every feature of the invention specified in the claims. Therefore, the "light source is glued to the exterior of the input end of the optical conduit" of claim 9 must be shown or the feature(s) canceled from the claim(s). No new matter should be entered.

Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

***Claim Rejections - 35 USC § 112***

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

2. Claim 6 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. The term "gradual bend" is illustrated in the figures and discussed in the specification; however a workable meaning of the term is not provided. Would a ninety-degree bend be considered gradual? Would a forty-five-degree bend be considered gradual? The illustrated embodiment is understandable, but the claim language is indefinite for one skilled in the art to determine the difference between a gradual and non-gradual bend placed in the optical conduit.

***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. Claims 1, 2, 4, 5, and 7 are rejected under 35 U.S.C. 103(a) as being unpatentable over Pelka et al. (USPN: 6637924), hereinafter Pelka in view of Dimmick (USPN: 5151679).

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Regarding claim 1, Pelka discloses an optical conduit (Figs. 11-15 element 70) with an input end (Figs. 11-15, element 74), an output end (Figs. 11-15, element 80) and a curved surface that totally and internally reflects light from the input end towards the output end (col. 14, lines 8-19). Pelka further discloses a light source (Fig. 14, element 12) but does not expressly disclose that the light sources are embedded at the input end of the body. Dimmick discloses a light pipe (Fig. 3, element 80) with a light source (Fig. 3, element 90) embedded in an end of the light pipe (col. 11, lines 22-27).

Pelka and Dimmick are analogous art because both deal with light transmission systems involving total internal reflection. It would have been obvious to one in the art at the time of invention to utilize a curved surface optical conduit as disclosed by Pelka and embedding the light into the input end as disclosed by Dimmick. The motivation for doing so would have been so that the light source only provides illumination to the light conduit and display areas beyond the conduit rather than losing light to surrounding areas and to reduce maintenance and cost of operation (Dimmick, col. 3, line 63 – col. 4, line 1). Therefore, it would have been obvious to combine the teachings of Pelka and Dimmick to produce a device as specified in claim 1.

Regarding claim 2, the Examiner takes Official Notice that it is old and well-known in the art to provide reflector cups surrounding light sources to redirect light towards optical systems so that light energy is not lost. Therefore, it would have been obvious to one skilled in the art to provide a reflective cup

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around the light source on the input end to direct light towards the output end of the light conduit.

Regarding claim 4, Pelka discloses the use of various shapes for a light conduit (Figs. 11-13). The Examiner notes that the shape of the conduits shown in Figs. 12 and 13 are non-symmetrical. Such figures could be broken into segments where different areas of the walls could be shown to fit different equations. Thus, it would have been a matter of design choice for one skilled in the art to provide an optical conduit with surface sections fitting different equations as shown by Pelka.

Regarding claim 5, Pelka discloses using a light emitting diode as the light source (Fig. 14, element 12). And Dimmick also discloses using a light emitting diode as the light source (Fig. 3, element 90).

Regarding claim 7, Pelka discloses that the light conduit (Figs. 11-15, element 70) can be formed with the middle using materials such as "glass or polymer-based materials" (col. 14, lines 12-14) and that the optical conduit could also be made out of "acrylic, polycarbonate, and silicone" (col. 14, lines 20-22).

4. Claim 3 is rejected under 35 U.S.C. 103(a) as being unpatentable over Pelka in view of Dimmick as applied to claim 2 above, and further in view of Zimmerman et al. (USPN: 6869206), hereinafter Zimmerman.

Regarding claim 3, as shown above the combination of Pelka and Dimmick disclose all of the limitations of claim 2 that are part of claim 3. However, neither expressly discloses providing the optical conduit as a

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paraboloid. Zimmerman discloses an optical pipe for transmitting light from an input to output that uses a parabolic shape (Fig. 11, element 426 and col. 13, line 63 – col. 14, line 2). The Examiner notes that the figure shown is a cross-section of the optical pipe and the three dimensional light pipe would then have a paraboloid shape.

Pelka, Dimmick, and Zimmerman are analogous art because all deal with optical transmission systems. It would have been obvious for one skilled in the art at the time of invention to use an optical guide using a parabolic shape as disclosed by Zimmerman as the optical guide used by Pelka with an embedded light source as disclosed by Dimmick. This would have been a matter of design choice to utilize such a specific shape rather than a non-specified shape. Pelka, in Figs. 11-13, shows the use of different shapes and Zimmerman also shows different shaped conduits including non-curved shapes in Figs. 11 and 12. Thus it would have been obvious to make the optical conduit into a paraboloid shape to produce a device as specified in claim 3.

5. Claims 8 and 9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Applicant's admitted prior art (Figs. 1 and 2, discussion in the background of the invention) hereinafter AAPA, in view of Zimmerman.

Regarding claim 8, AAPA discloses an optical mouse (Fig. 1, element 100) with a housing (assumed as the box enclosing the elements of Fig. 1; and well-known that a mouse has an outer body); an image sensor (Fig. 1, element 109); a light source (Fig. 1, element 103); an optical conduit with input and output

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ends (Fig. 1, element 101); and a lens (Fig. 1, element 107) to focus light reflecting off a surface (Fig. 1 element 105). However, AAPA does not expressly disclose making the optical conduit with a curved interior surface. Zimmerman discloses an optical conduit (Figs. 11-13 element 70) with a curved interior surface (Fig. 11, element 432) that totally and internally reflects light from the input end towards the output end (col. 13, line 66 – col. 14, line 2).

AAPA and Zimmerman are analogous art because both deal with light transmission systems with optical conduits. At the time of invention it would have been obvious to one skilled in the art to use an optical waveguide with curved surfaces in place of one with straight surfaces as a matter of design choice as shown by the different embodiments of Zimmerman (Figs. 11 and 12). Therefore, it would have been obvious to produce a device as specified by claim 7.

Regarding claim 9, the Examiner takes Official Notice that it is old and well-known in the art to use an optically transparent glue to connect a light source to a wave guide or light pipe, where the glue has the same index of refraction so that light transmission is kept to a maximum from the light source to the waveguide.

6. Claims 10-12 are rejected under 35 U.S.C. 103(a) as being unpatentable over AAPA in view of Zimmerman as applied to claim 8 above, and further in view of Dimmick.



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Regarding claim 10, as discussed above, the combination of AAPA and Zimmerman disclose all of the limitations of claim 8 that are part of claim 10. However, neither expressly discloses embedding the light source within the input end of the optical conduit. Dimmick discloses a light pipe (Fig. 3, element 80) with a light source (Fig. 3, element 90) embedded in an end of the light pipe (col. 11, lines 22-27).

AAPA, Zimmerman and Dimmick are analogous art because both deal with light transmission systems involving total internal reflection. It would have been obvious to one in the art at the time of invention to utilize a curved surface optical conduit as disclosed by Zimmerman and embedding the light into the input end as disclosed by Dimmick for use in the optical mouse of AAPA. The motivation for doing so would have been so that the light source only provides illumination to the light conduit and display areas beyond the conduit rather than losing light to surrounding areas and to reduce maintenance and cost of operation (Dimmick, col. 3, line 63 – col. 4, line 1). Therefore, it would have been obvious to combine the teachings of AAPA, Zimmerman and Dimmick to produce a device as specified in claim 1.

Regarding claim 11, the Examiner takes Official Notice that it is old and well-known in the art to provide reflector cups surrounding light sources to redirect light towards optical systems so that light energy is not lost. Therefore, it would have been obvious to one skilled in the art to provide a reflective cup around the light source on the input end to direct light towards the output end of the light conduit.

Regarding claim 12, Zimmerman discloses an optical pipe for transmitting light from an input to output that uses a parabolic shape (Fig. 11, element 426 and col. 13, line 63 – col. 14, line 2). The Examiner notes that the figure shown is a cross-section of the optical pipe and the three dimensional light pipe would then have a paraboloid shape.

7. Claims 13 and 14 are rejected under 35 U.S.C. 103(a) as being unpatentable over AAPA in view of Zimmerman in further view of Dimmick.

Regarding claim 13, the limitations of this claim are the same as the limitations of claim 10 except that claim 13 lacks the limitation that the interior surface of the optical conduit need be curved. Because of the similar limitations between the two claims the arguments used for claims 8 and 10 can be similarly applied to claim 13. Further, the Examiner notes that because a curved surface is not required by claim 13, merely using the teachings of Dimmick to embed the light source into the input of a light pipe with the teachings of AAPA would produce a device that would read on claim 13.

Regarding claim 14, the Examiner takes Official Notice that it is old and well-known in the art to provide reflector cups surrounding light sources to redirect light towards optical systems so that light energy is not lost. Therefore, it would have been obvious to one skilled in the art to provide a reflective cup around the light source on the input end to direct light towards the output end of the light conduit.

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**Conclusion**

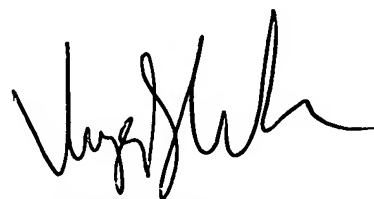
8. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. El-Sherif (USPN: 5060307) discloses the use of a resin as a glue connection between a light source and optical fiber (Fig. 3, elements 34A, 33 and 25 and col. 4, lines 35-38).

9. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Steven E. Holton whose telephone number is (571) 272-7903. The examiner can normally be reached on M-F 8:30-5.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Bipin Shalwala can be reached on (571) 272-7681. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

S.E.H.  
August 26, 2005



**VIJAY SHANKAR**  
**PRIMARY EXAMINER**

Steven E. Holton  
Examiner  
Art Unit 2673

✓